

X marks the spot

NASA recently released this Hubble Space Telescope near-infrared picture of a disk around the star HD 141569, located about 320 light-years away in the constellation Libra.

The telescope photo shows that the 75 billion-mile-wide disk seems to come in two parts: a bright inner region that is separated from a fainter outer region by a dark band. It superficially resembles the largest gap in Saturn's rings (known as the Cassini division).

Astronomers using the Hubble Space Telescope are excited to find this dark gap dividing an immense dust disk around a young, but fully formed star - like a wide groove in a phonograph record.

One theory is that a planet may have gravitationally carved out the 3.7 billionmile-wide rut.

The vast disk is 75 billion miles across, or about 13 times the diameter of Neptune's orbit.

The inner edge of the gap is 21 billion miles from the

Though already a fully formed, "adult" star, HD 141569 is relatively young, probably only one percent through its lifetime as a stable star. The star is nearly three times more massive and 22 times brighter than our Sun.

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John F. Kennedy Space Center

Apollo-era high altitude chamber reactivated

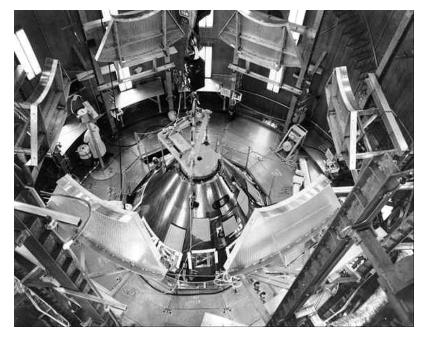
Out of action for more than 20 years, one of two Kennedy Space Center high-altitude chambers formerly used to test Apollo Program flight hardware has been reactivated for use in leak testing International Space Station (ISS) pressurized modules.

Use of the chambers first began in 1965 at KSC to test the Apollo command service modules and lunar service modules. They were last used in 1975 in support of the Apollo-Soyuz Test Project missions.

In 1985, the pumping equipment and control room were removed and scrapped, and the chamber sat unused until now.

In 1997, in order to increase the probability of successful missions aboard the ISS, NASA decided to perform leak tests on ISS pressurized modules at KSC.

Reactivation of the "west" altitude chamber in the Operations and Checkout Building (O&C) high bay was determined the most practical and feasible option for the procedure.



The Apollo 11 spacecraft command and service modules were tested in the Operations and Checkout Building's altitude chamber in 1969. Segments of a workstand, used to work near the top of the spacecraft, are seen here lifted and pulled back against the circular walls of the chamber. Apollo 11 carried Neil Armstrong, Edwin Aldrin and Michael Collins to the moon for mankind's first lunar landing on July 20, 1969.

The chamber, 33 feet in diameter and 50 feet tall, is constructed of stainless steel. The rotation handling fixture, which holds the module, is aluminum.

After installation of new vacuum pumping equipment and controls, a new control room and a new

(See Chamber, Page 2)

Y2K & KSC: The computer countdown of the millennium

In 10 months, is your software going to party like it's 1899?

This question kicks off an ad for a software company, but its clever query reminds us of a particularly persistent pest for everyone — the Y2K bug.

The Y2K (or Year 2000) software bug arises from computer programs using only a two-digit field to identify years (e.g., 78 = 1978) and assuming only a single century — the 1900s.

Computers, therefore, when the clock strikes midnight on Jan. 1, 2000, will attempt to read '00' as the year 1900.

Although traveling back in time can be pretty fun in the movies, it can wreak havoc inside a computer. If processors fail to recognize the

"00" as an actual value, they may get stuck in an endless loop looking for a viable value, causing machinery and electronic systems to stop functioning.

Or, systems may recognize the value as 1900 or some other previous date (many default to 1980), destroying the integrity of electronic billing systems and time management systems that rely on accurate dates and times to function

In order to ensure KSC's smooth transition into the new millennium. Y2K Project Manager Art Beller is working on this issue that comes up, well, once in a century. But his deadline is more imminent.

"KSC is now working on finding and fixing all possible Y2K-related

problems by Mar. 31 this year," Beller noted. "That is a government-wide deadline determined for NASA and other agencies by the Office of

Management and Budget [OMB] in order to allow nine months of operating time to establish confidence in the systems."



Beller's group is actively working toward the goal of

(See Y2K, Page 3)

Local students attend International Space Station teleconference

by Anita Barrett

Put about 80 students in a room with a former astronaut and a congressman who is vice chairman of the Space Subcommittee and you're guaranteed to get questions about space and the future.

That was true on Feb. 18 when Center Director Roy Bridges and U.S. Congressman Dave Weldon briefly spoke to a gathering of students attending an International Space Station (ISS) teleconference at the Center for Space Education at KSC's Visitors Complex.

The students, from Ronald McNair Magnet School, in Rockledge, Fla., participate in the SEARCH (Science, Engineering And Research Career Help) Mentor and EarthKAM (Earth Knowledge Acquired by Middle School Students) programs.

Bridges opened by telling the students his experience in space.

"It is so much fun up there in zero G," he said. "I bet if you were there now, you wouldn't be listening to me. You'd be turning somersaults and floating through the orbiter."

Bridges told the students that, as adults, they would likely have the opportunity to live and work in space, which will come about as a result of current efforts to begin constructing the International Space Station.

"We have at KSC right now the hardware for the next building phases, which will allow three people to occupy the International Space Station," Bridges said. "By the time you have kids, or grandkids ... you might be going to a hotel in space from Spaceport Canaveral instead of a cruise ship from Port Canaveral."

Weldon then discussed his experience with the Space Subcommittee in Washington.

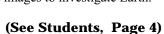
"When I tell people what part of Florida I represent, I always tell them the part that includes Cape Canaveral and the Kennedy Space Center," Weldon said. "They always get a big smile on their faces; The space program is a big source of pride for Americans."

Students' questions ranged from what a day at work is like to why Weldon left his first career as a doctor to become a politician.

The talk with Weldon quickly moved to a live satellite teleconference titled, "Some Assembly Required," about building the International Space Station.

The live telecast permitted calls and faxes to presenters and panelists that included STS-88 Commander Robert Cabana and Mission Specialist Jerry Ross.

The SEARCH Program teams atrisk students with mentors at KSC and they participate in several science and engineering-type activities throughout the school year. The EarthKAM students participate in a mission, using interactive Web pages to target and select images to investigate Earth.

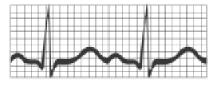




Students from Ronald McNair Magnet School in Rockledge attended a teleconference about the International Space Station on Feb. 18 at KSC. Congressman Dave Weldon, left, talked to the students about space, politics and the future.

Focus is on stress during Mental Health Month

KSC's Health Education and Wellness Program focuses on stress management during March. Packets of information on relaxation techniques and selfadministered stress assessment tests are available at all medical clinics and upon request to Carol Roth at 867-3414. Also, vision screening is offered the second and fourth Tuesday of each month from 11 a.m. to 1 p.m. at the OHF.



Chamber ...

(Continued from Page 1)

rotation and handling fixture, the chamber will become operational once again. At present, the chamber is undergoing final verification testing.

"The module testing should give us confidence that they are problem-free," commented Steve Francois, director, Space Station and Shuttle Payloads.

"More important, though, is that we'll be able to confirm usage rates of all the gases needed, which could allow us to reduce the quantity carried instead of planning for the worst case," he added. "That is more efficient."

To perform the leak testing, a module is lowered inside the chamber. Once secured, the chamber creates a vacuum environment to determine if the module has any leaks. The required vacuum takes six hours to achieve.

"The testing simulates a space environment for low earth orbit," said Tommy Mack, project manager for the reactivation of the chamber.

After achieving the required vacuum, testing begins and may take two weeks, according to Mack, "depending on what the tests reveal."

The first module to be tested will be the U.S. Laboratory, currently located in the Space Station Processing Facility.

When verification testing of the chamber has been completed, the U.S. Laboratory will be transported to the O&C high bay and placed in the chamber for leak tests. No date has been determined for the testing.

At press time, the chamber was scheduled to be turned over to ISS payload operations on March 1.



Cutting a red ribbon for the unveiling of a newly renovated altitude chamber are (left to right) Tommy Mack, project manager, NASA; Steve Francois, director, Space Station and Shuttle Payloads; Sterling Walker, director, Engineering Development; Roy Bridges, director, Kennedy Space Center; Jay Greene, International Space Station manager for Technical; Michael Terry, project manager, Boeing; and Terry Smith, director of Engineering, Boeing Space Coast Operations. The chamber was reactivated, after a 24-year hiatus, to perform leak tests on International Space Station pressurized modules at the launch site. Originally, two chambers were built to test the Apollo command and lunar service modules. They were last used in 1975 during the Apollo-Soyuz Test Project.

Y2K ...

(Continued from Page 1)

assuring that all software, hardware, communications and networking at Kennedy Space Center is Y2K-compliant.

Beller's group completed an initial inventory of Y2K non-compliant systems in 1997 and a subsequent inventory of all Y2K-vulnerable items early this year at KSC. This total inventory includes launch and payload processing systems, laboratory test equipment, desktop computers, fax machines, printers, fire suppression systems and power monitoring systems, among others.

"Inventorying items has allowed us to identify and fix the problems and to further mitigate risk by certifying already compliant items," said Beller.

According to Beller, fixing the Y2K problem isn't a technical issue.

"Fixing the date problem internally in computers isn't difficult, once we knew where the fix needed to occur," Beller pointed out. "It was finding all of the embedded dates in the wealth of old computer code that exists across the center that was the challenge."

So the center embarked on a finding and fixing mission in six phases, starting back in 1996. The first stage was awareness.

"Awarenesss is key to the whole issue," Beller noted. "Until Year 2000 awareness filtered down to everyone, it wasn't going to get done. It needed to be a proactive effort."

The second stage was to inventory all systems at KSC, which included locating and listing every system that needed to receive a technical fix for Y2K compliance.

All systems were inventoried over the past

two years, and remediation quickly began.

Remediation basically means fixing the problem, either by replacing, repairing or retiring the culpable item.

Once fixed, the system can then be validated (or checked), put back into productional use and then certified, which places a final stamp of approval on the system as Y2K-compliant. By Mar. 31, all KSC systems will have been certified as Y2K-compliant.

"At present, we have eight mission-critical systems at KSC and four have been certified," Beller noted. "The other four will be certified by the end of March."

That's a pretty good record, which mirrors a recent OMB quarterly progress report for NASA overall. The report, dated Feb. 15, stated that in the entire Agency, 87 percent of a total of 157 mission-critical systems have been made Y2K-compliant. More than 52,000 workstations and file servers in NASA were tested for computer chip problems associated with Y2K.

The report stated that corrective actions have been made to approximately 92 percent of nonmission-critical systems needing repair.

At KSC, of 122 non-mission-critical systems, 110 were certified as of Jan. 31. One hundred twenty have been renovated and validated, with 115 of those systems put back in productional use, awaiting final certification.

"End-to-end testing and simulations for the Space Shuttle are currently planned for the April to July 1999 time period," Beller added.

End-to-end tests involve a thorough systems check to see how input, processing and output is functioning.

"In the next few months, end-to-end tests will involve the Mission Control Center in Houston, the Mission Control Center in Moscow, a Shuttle



vehicle on the launch pad here at the Kennedy Space Center, launch facilities, launch support facilities and the space operations networks necessary to support these tests," Beller said. "It's very thorough."

Prior to this testing, KSC will receive Shuttle data tapes from Johnson Space Center that will include measurements and information as if for a specific launch. Together, the centers will simulate a launch, akin to the Terminal Countdown Demonstration Tests that Kennedy Space Center runs periodically. During these tests, however, the centers will roll the clocks forward to simulate a future launch and test all systems to see how they function.

Y2K end-to-end tests for the International Space Station are scheduled to be complete by July 1999.

The Agency anticipates a total cost for the Y2K problem of about \$46.7 million, of which KSC costs to date add up to approximately \$5.5 million.

KSC's All American Picnic approaches

The 1999 KSC All-American Picnic will be held on Saturday, Apr. 10, from 10 a.m. to 4 p.m. at KARS Park 1.

The picnic is open to all KSC employees, their families and friends.

Ticket prices are \$4 for adults (ages 13 and up) and \$3 for children (ages 3 to 12). Tickets purchased the day of the event will cost an additional \$1.

Ticket price includes admission to the picnic, a meal, drinks, rides, games, contests, entertainment and a lot of fun!

Check out KSC's Picnic Web Site on the KSC Internal Home Page for more details on the Children's Carnival; Sports Activities; Kid's Fishing Tournament; Wildlife Encounter/Zoo; Cultural Cuisine; Car Show; and Entertainment. Volunteers are needed in all areas. If you would like to volunteer to assist in any way, please contact Cindy Coddington at 867-3758 or Wanda Redmond at 861-3510.

Tickets are now on sale. You can purchase tickets at NASA Exchange Retail Stores or by contacting the following individuals:

- Ken Williams, 867-1624, Hypergolic Maintenance Facility, TR622;
- Lynn Cassell, 861-1022, Orbiter Processing Facility HB-1, Mezzanine, Room 241;
- Peggy Bennett, 861-5254, Logistics Facility, K6-1547, Room 1775;
- Debbie Norris, 799-7001, NASA Shuttle Logistics Depot (NSLD) 2, Room 614;
- Jerri Thews, 861-6333, Vehicle Assembly Building, Room 2K12;
- Linda Lee, 861-0100, Pad A;
- Pat Mecouch, 853-7587, Hangar AF;



- Peggy Parrish, 476-4000, Hangar I Annex, Bldg. 55150, Room 204;
- Tiffany Nail, 853-5081, Engineering and Operations Building, Cape Canaveral Air Station, Room 200;
- Carol Swem, 799-5527, NSLD 1, Room 420;
- Cecilia Reid, 861-1340, Launch Control Center, Room 2R13.

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Women's History Month luncheon

In celebration of Women's History Month, the Federal Women's Program Working Group will host a luncheon on Mar. 12 from 11:30 a.m. to 1 p.m. at KSC's Visitor Complex Lunch Pad.

The topic, "Women Putting our Stamp on America," will be addressed by Guest Speaker Julia Anita, director of Protocol Essentials in Windermere, Fla

The luncheon will include ziti, fettucini alfredo, salad and a beverage for \$8.50. Tickets can be purchased from Jean Rhodes at 867-2307, Valarie Franklin at 867-7051, Kim Boatright at 861-3801 or Connie Dobrin at 861-5317.

STS-93 crew visit at KSC rings a bell



Last month, the STS-93 crew visited KSC to get a close-hand look at their payload, the Chandra X-ray Observatory, and while here, they toured KSC's Space Shuttle Main Engine Facility. Above, Commander Eileen Collins (left) and Mission Specialist Catherine Coleman get a close-up look inside the bell of an engine. Standing on the ground are, left to right, Mission Specialist Michel Tognini, representing France's Centre National d'Etudes Spatiales; Pilot Jeffrey Ashby; and Mission Specialist Steven Hawley. STS-93, scheduled to launch July 9 aboard Space Shuttle Columbia, has the primary mission of deploying the Chandra X-ray Observatory, the world's most powerful X-ray telescope. Chandra will allow scientists from around the world to see previously invisible black holes and high-temperature gas clouds, giving the observatory the potential to rewrite the books on the structure and evolution of our universe. STS-93 will also be the first Shuttle mission commanded by a woman.

African American History Month celebrated



Center Director Roy Bridges, right, celebrated African American History Month with employees at the Black Employees Strategy Team African American Breakfast held Feb. 18 in the Apollo/Saturn V Center. A breakfast buffet was served to attendees, followed by a program in the Lunar Theater. Major General Titus Hall, USAF (Ret.) was the guest speaker. Hall is founder and chairman of STARSAT 1200, Inc., an organization trying to improve the Scholastic Aptitude Test program.

Students ...

(Continued from Page 2)

The KSC Coordinator for SEARCH is Tracy Young and the coordinator for EarthKAM is Denise Coleman, both with the Center for Space Education. The teleconference was a natural fit between the programs and NASA's goal to introduce students to various elements of aerospace technology.



John F. Kennedy Space Center

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